



August 31st, 2010

Dr. W.F. Brinkman
Director, Office of Science
U.S. Department of Energy
Washington, DC, 20585

ASCAC Exascale Report Status

Dear Dr. Brinkman,

On August 24-25, 2010, the Advanced Scientific Computing Advisory Committee (ASCAC) discussed its report on the Opportunities and Challenges of Exascale Computing. Though we have not quite finished our final report and response to the charge of October 29, 2009, there is unanimous strong support by ASCAC for the Exascale Initiative. On behalf of ASCAC, I wanted to convey some key elements of the report we are developing.

Overall, we concur with the conclusion of the Trivelpiece Exascale Workshop Panel that

“...there are compelling needs for exascale computing capability by the DOE’s mission programs in energy, national security, fundamental sciences, and the environment. The DOE has the necessary assets to initiate a program to accelerate the development of such capability to meet its own needs and, by so doing, benefit other national interests. Failure to initiate such a program could lead to a loss of U.S. competitiveness in several critical technologies.”

Key findings include:

1. The 11 Disciplinary workshops and 3 crosscutting panels have thoroughly explored and validated the impact of Exascale computing across DOE mission areas and key areas of national need. Exascale computing will be transformative for some science and engineering applications and will benefit all of them.
2. The US and DOE have been leaders in high performance computing since its beginning. Exascale is the only path forward to maintain this leadership, which is essential to addressing many of the nation’s most critical problems. Modeling and simulation enabled by Exascale will be key to competitiveness not only for US HPC companies but also for many other technology industries.
3. The co-design strategy for going to Exascale - linking developments in computer hardware and software, mathematics, and applications - mitigates risk by allowing adaptation along the path to success. Unlike some other large facilities which only are useful on completion, Exascale technology will have impacts at many stages of its development before achieving the full 1000 fold increase in capability.

We will therefore be recommending that DOE pursue the Exascale Initiative as one of the highest national priorities.

The ASCAC Exascale Subcommittee continues to work on our full response to the charge, which we expect to be completed before the next face to face ASCAC meeting in November, 2010.

Sincerely,

Dr. Roscoe C. Giles,
Chair, ASCAC
Center for Computational Science
Department of Electrical and Computer Engineering
Boston University

CC: Dr. Steven E. Koonin, Undersecretary for Science, U.S. Department of Energy
Dr. Daniel Hitchcock, Acting Associate Director, ASCR
Dr. Christine Chalk, ASCAC DFO, ASCR